

Circadian advantage

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Circadian advantage is a term that refers to a sporting team's advantage over another by virtue of its relative degree of acclimation to a time zone versus their opponent. While this concept was explored by researchers at Stanford in 1997,^[1] and at the University of Massachusetts,^[2] the term was coined in 2004 by Dr. W. Christopher Winter, a sleep specialist and neurologist studying the effects of travel between time zones on Major League Baseball (MLB) performance.^[3] This study was expanded into a ten-year retrospective study with a grant through MLB that was completed by Dr. Winter and his research assistant Noah H. Green, then an undergraduate student at the University of Virginia. The work was presented in 2008 at the 22nd Annual Meeting of the Associated Professional Sleep Societies in Baltimore, Maryland.^[4]

Using the convention that for every time zone crossed, synchronization to that time zone requires one day, teams can be analyzed during a season to see where they are in terms of being acclimated to their time zone of play. For example, consider a MLB team based in Washington D.C. If they have been competing at home for the last 3 days or more, they would be completely acclimated to Eastern Standard Time (EST). If they were to travel to Los Angeles, upon arrival they would be 3 hours off, because they traveled 3 time zones west. Every 24 hours spent on the west coast, would bring them 1 hour closer to acclimation.^[5] So after 24 hours in Los Angeles, they would be 2 hours off. After 48 hours, they would be 1 hour off, and after 72 hours, they would be acclimated to west coast time and would stay that way until they left their time zone.

Unlike home field advantage which is present any time two teams play a game that is not held in a neutral site, circadian advantage does not apply to all games. In a typical MLB season, it applies to approximately 20% of games played with the other 80% featuring teams at equal circadian advantage. In sports that allow more time between games, it may apply to significantly fewer games. Circadian advantage is much more of an issue in sports that feature significant international travel.

Circadian advantage is most significant when a team holds a 3-hour advantage (or more) over another. This match-up is only encountered after coast-to-coast flights in the continental United States where the traveling team plays soon after arrival. As the magnitude of time zone differences between two teams becomes smaller, so too does circadian advantage.

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